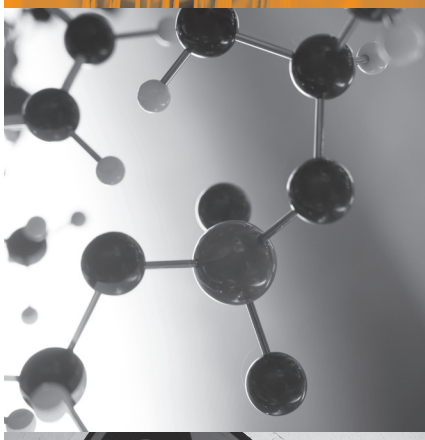
National Institute of Environmental Health Sciences
Worker Training Program

National Institute of Environmental Health Sciences Worker Training Program
Spring 2015 Workshop Report

Exploring Training Solutions to Insufficient Chemical Regulation in the Workplace



June 2015

The following document includes a report compiled from the NIEHS Worker Training Program (WTP) workshop held on February 26-27, 2015 in Portland, Oregon. This workshop followed the semiannual WTP awardee meeting on February 25 in the same location. Presentations from the workshop may be found at http://www.niehs.nih.gov/about/visiting/events/pastmtg/hazmat/2015/spring_meeting/index.cfm.

Table of Contents

Introduction

American workers are exposed to thousands of chemicals every day, and new chemicals are being developed faster than their safety can be evaluated. Each year in the U.S., thousands of workers are made sick from chemical exposures, and the long-term effects of chemical exposures in the past are believed to cause as many as 50,000 deaths annually, according to the *Occupational Safety and Health Administration (OSHA)*. In addition, it is commonly believed that the laws governing the use of toxic chemicals are antiquated and often ineffective at protecting workers, public health, and the environment.

For many years, the National Institute of Environmental Health Sciences (NIEHS) Worker Training Program (WTP) has funded a national network of nonprofit training organizations to provide safety and health training to workers involved in the manufacturing, use, and disposal of hazardous materials, and in the emergency response to hazardous material incidents. Periodically, NIEHS WTP and its awardees meet to explore training issues, content, and approaches that have a direct impact on the safety and health of the workers they serve.

Thus, the NIEHS WTP held a workshop on February 26-27, 2015, focused on the risks workers face given outdated chemical regulation in the U.S. The workshop agenda can be found in Appendix 1.

"This meeting is about the core messages we want to implement in our training about the topic of chemical exposure, risk, and protection," NIEHS WTP Director Chip Hughes, explained. "We need to think about approaches we can share in our training courses and provide worker students with science-based tools to help them. As we face such complicated problems, the only way to be protective is to use the precautionary principle. We should not be using workers as guinea pigs," Hughes said.

Potential Use in Training: The Precautionary Principle

"The precautionary principle (*United Nations Conference on Environment and Development 1992*) holds forth that a point can presumably be reached when human well-being and environmental health are put at risk by a large-scale human activity or man-made system over which humans have control. At such a point the problem could be identified, a course charted, and precautionary actions taken to ameliorate or prevent a potential threat to human and environmental health on behalf of current and future generations." Salmony SE. 2005. Invoking the precautionary principle. Environ Health Perspect 113(8): A509–A510.

Keynote Address: Current Laws Are Not Protecting Us from Chemicals

Journalist *Elizabeth Grossman* provided a keynote address that laid out the extent of the problem. Grossman, a Portland-based environmental and science writer, has written for a number of peer-reviewed journals of research and news, including Environmental Health Perspectives, Environmental Health News, Yale Environment 360, Scientific American, and The Washington Post. Her books include Chasing Molecules and High Tech Trash.

Current laws that are supposed to protect workers and consumers were enacted in the 1970s and have hardly, if at all, been updated. The Toxic Substances Control Act (TSCA), passed in 1976 (and not updated since) addresses the production, importation, use, and disposal of specific chemicals. It provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Many substances are generally excluded from TSCA, including food, drugs, cosmetics, and pesticides.

According to the EPA, there are now more than 84,000 chemicals registered for commerce in the U.S. and listed on the TSCA inventory. Some 62,000 of these were in use when the first TSCA inventory was published in 1979 – three years after TSCA was enacted.

When TSCA was enacted, it was aimed at large sources of pollution and acute health effects. We now look at health affects differently, and understand that chronic diseases induced by chemical exposures can take a long time to manifest. We also understand that diseases may result from low-level exposures and developing babies or children may be particularly vulnerable to these effects. In addition, the science has changed. Many chemicals we thought would stay in products actually seep out and interact with living cells. The laws on the books today do not address any of these issues. Furthermore, chemicals are regulated one at a time, while no one is exposed to just one chemical at a time.

It is very confusing as to who is regulating what. Several limitations currently exist:

- Some chemicals that are in "legal limbo" are not on any list.
- Limited data is available on endocrine disruptor chemicals.
- Limited testing has been performed under TSCA.
  - About 200 chemicals have had full testing.
  - Most chemical products do not have full testing data.
- Limited reporting is available in the Toxic Release Inventory (TRI), which covers only 689 chemicals. Facilities are only required to report to the TRI Program if they meet the following three threshold criteria:
  - The facility is included in a TRI-covered industry (as classified by the North American Industry Classification System (NAICS);
  - The facility has 10 or more full-time employee equivalents; and
  - The facility manufactures, imports, or processes more than 25,000 pounds of a listed chemical; or to companies that use more than 10,000 pounds of a listed chemical in a given year.
- Limited numbers of chemicals are covered under the Clean Air Act.
  - EPA currently lists 187 hazardous air pollutants.
- OSHA has Permissible Exposure Limits (PELS) for fewer than 500 chemicals.
  - Since 1971, OSHA has been successful in establishing or updating PELs for only about 30 chemicals.

The quality of information available to people using chemicals is also variable and limited. Safer chemicals have limited available data and do not say how dangerous they really are, running the risk of regrettable substitution (replacing a toxic chemical with one of equal or even higher toxicity).

Based on the same scientific information, two regulatory authorities can come to different conclusions. For example, there are about 80 pesticides that are banned in Europe that are currently used in the U.S.

It is difficult to decide what is safe when you are faced with decisions. Many times, it is impossible to know and decisions are subjective.

At the top of the list of challenges related to U.S. chemical policy, new chemicals are developed frequently, and we continue to launch new technologies without thinking about the health impacts of their use (e.g., 3D printing can release many chemicals).

Potential Use in Training

- Discussion of how regulation has not kept up with the science
- Discussion of the weakness of exposure-based regulation

Session I: Things Are Beginning to Change

Craig Slatin, Sc.D., opened this approach-based session. Slatin is the principal investigator and director of the New England Consortium, an awardee of the NIEHS WTP. He addressed green chemistry as an initiative for safer chemicals – chemicals that hopefully will not result in adverse health effects. Slatin pointed out that production and commerce move quickly. Even with the application of a green chemistry initiative in a work place, the results are limited if only chemical exposures are considered and not the entire work process.

Paul Davis, senior marketing analyst from *Columbia Forest Products*, talked about his company's efforts to eliminate formaldehyde from its products. The company introduced a soy-based adhesive and now 60 percent of their panels are made using that technology. They won the U.S. Environmental Protection Agency (EPA) 2007 presidential green chemistry challenge in the category of greener synthetic pathways. They were also able to eliminate urea formaldehyde adhesive from standard veneer core and agrifiber core construction. The product is compliant with Leadership in Energy and Environmental Design (LEED) standards and offers a measurable reduction in formaldehyde emissions from decorative hardwood plywood manufactured on UF-bonded particleboard and medium density fiberboard. They introduced a class of adhesives now used in the majority of domestically produced decorative plywood panels.

James Connelly, Living Building Challenge Coordinator from the *International Living Future Institute* (ILFI), reminded participants that change comes with awareness. Work on the *Living Building*

Challenge™ and other programs has enabled the ILFI to help redefine the green building movement and substantially raise the bar for true sustainability. ILFI works with local community partners to create grounded and relevant solutions.

Connelly explained that toxic chemicals are pervasive in our environment and that we, as consumers, do not know or understand the exposure routes or the risks involved with these chemicals. Thus, manufacturers should be transparent about chemical use in order to raise awareness and to allow consumers to make informed decisions.

Connelly described the Living Building Challenge as the most rigorous performance standard for the built environment. It calls for the creation of building projects that operate as cleanly, beautifully, and efficiently as nature's architecture at all scales. To be certified under the challenge, projects must meet a series of ambitious performance requirements over a minimum of 12 months of continuous occupancy.

The precautionary principle guides the Living Building Challenge approach to considering potential toxicities of materials and their effects on human health. When applied to material toxicity, this approach means we should avoid toxic chemicals when a serious risk to human or environmental health is identified. It places the burden of proof on the manufacturer to demonstrate the safety of a chemical before it is used.

ILFI uses the Materials Red List to identify and eliminate from the built environment, the worst chemicals and materials from a human health standpoint. While many other materials pose concerns, those on the Red List are deemed ones that the building industry itself is likely to significantly curb, if not eliminate from manufacturing. The red list includes chemicals of concern like carcinogens, persistent organic pollutants, and reproductive toxicants, many of which build up in organisms and the broader environment.

Declare is another ILFI program that proactively addresses the issue of transparency in products by asking three questions of manufacturers: 1) where does a product come from, 2) what is it made of, and 3) where does it go at the end of its life? Relatively similar to Declare is the *JUST* program, which is a voluntary disclosure tool for socially just and equitable organizations.

Potential Use in Training

- Discussion of the difference between chemical policies aimed at limiting exposure and those that focus on the hazard of the chemical itself
- Discussion of companies and organizations trying to make a difference

Session II: Drivers of the Change to Safer Chemicals

Sarah Doll, national director of *Safer States*, discussed the current landscape of chemical regulation and what it means for workers. Safer States is a coalition of health-based organizations working to change the way the U.S. regulates chemicals in products. They believe families, communities, and the environment deserve to be healthy and not exposed to dangerous chemicals. They believe that state policies will contribute to the formation of a cleaner, greener economy.

Doll stated that the current landscape is one in which toxic and untested chemicals are in everyday consumer products, and the rates of disease linked to toxic chemicals are on the rise. While there

is knowledge about some of the chemicals that workers are exposed to (see inset), it is likely the tip of the iceberg because manufacturers are often not required to disclose the chemicals in their products.

State policy is a key piece of the puzzle regarding changes to safer chemical use. Between 2003 and 2015, 35 states enacted 169 policies to help prevent toxics exposure. The policies in Maine, Vermont, and Washington require that manufactures disclose what is in their products. These disclosure policies allow for media coverage that may grab public attention. Manufacturers would rather remove toxic ingredients than reveal that their products contain them. The disclosure policies have an echo effect throughout the supply chain. Other state policies address a single threat by banning individual chemicals, such as formaldehyde, lead, cadmium, and phthalates.

For example, *12 states* have enacted 28 policies related to flame retardants. Polybrominated diphenyl ethers (PBDEs) are commonly used as flame retardants. Scientists have documented the bioaccumulation of PBDEs in wildlife and human biological samples (e.g., fish, marine mammals, and breast milk). PBDE exposure is linked to several adverse health outcomes, including endocrine disruption, decreased fertility, and developmental problems. PBDEs were once widely used in furniture and televisions. Since these policies have been in place, furniture makers and sellers have announced moves to go flame retardant-free, and healthcare systems (e.g., Kaiser Permanente) and purchasers (e.g., Facebook) have committed to flame retardant-free purchasing.

A dozen states now have green procurement policies. In 2015, at least 28 states are expected to consider legislation related to eliminating toxic chemical use in consumer products.

Alex Stone, Sc.D. from the *Washington State Department of Ecology* discussed the main reasons why people care about toxic chemicals, and further demonstrated the role of state policies for safer chemical initiatives by describing Washington state's efforts (see Figure 1, pg 8). Having worked as a chemist for the Washington State Department of Ecology for the past 17 years, Stone currently serves as the safer chemical alternative chemist for the Hazardous Waste and Toxics Reduction Program.

Selected Worker Exposures

- **Firefighters** are exposed to chemicals in household products including toxic flame retardants.
- **Salon workers** are exposed to formaldehyde and phthalates.
- **Construction workers** are exposed to chemicals in building products, such as phthalates in vinyl floorings.
- **Cashiers** are exposed to BPA in the BPA-coated receipts they touch all day long.

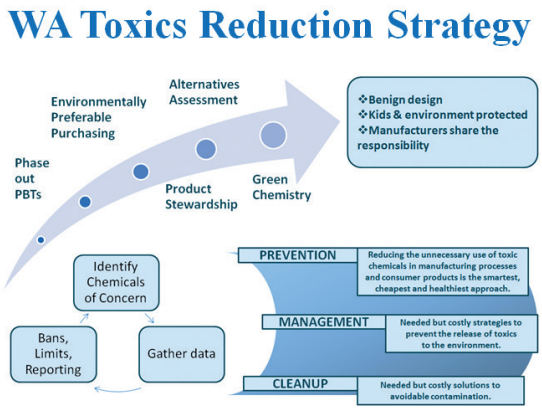
Here are the main reasons why people care about toxic chemicals:

- Our society is increasingly dependent upon chemicals; indeed, global chemical production is increasing at a rate faster than population.
- The true burden of environmentally-induced cancers has been largely underestimated, and the trends for linking exposures to other diseases (e.g., autism) are increasing.
- Public awareness is on the rise concerning chemical presence in consumer products, neighborhoods, and the risks they pose to health and quality of life. Awareness is also rising for worker health and safety.
- Environmental and chemical regulations are increasing globally. There is also an increase in the number of chemicals covered in each regulation. As regulations expand, the resources needed to implement these regulations will increase as well.
- Businesses have to consider balancing the costs and risks of replacing chemicals of concern, including assurances that the replacements have lower environmental impact than the chemicals that they are replacing.

Figure 1

How One State is Stepping Up

The Washington State Department of Ecology and their partners are making efforts towards safer chemicals in a number of ways, including (but not limited to) product bans, data collection, and stakeholder processes.



It is important to question the data and evidence that company claims are based upon concerning chemicals in products and their proposed safety. As "no data, no market" is becoming the legislated standard around the world, there is a need to prevent replacement of a toxic chemical with one of equal or even higher toxicity (i.e., regrettable substitution). However, we cannot make assumptions about the risk based solely on exposure – it is easier to quantify hazards and then reduce risk through material selection.

Washington state has banned several chemicals in specific products such as copper in brake pads, BPA in children's bottles, lead in wheel weights, and others.

The *Children's Safe Product Act* aims for transparency and requires company reporting on chemicals of high concern in children's products sold in Washington. Companies have reported data about products on a publicly available database which lists 66 chemicals or chemical groups such as flame retardants, metals, phthalates, volatile organics, and others. Funding was provided by the legislature to institute the *Product Testing Program*, which ensures compliance with Washington state bans and reporting requirements. They have tested a wide range of products and results are available *online*.

Washington state has several stakeholder processes that are in the works. Legislative policy proposals for alternative assessments, phase outs, and toxics reduction are outlined in the governor's *toxics reduction package*. Others include the *Northwest Green Chemistry Center*, which was developed through U.S. EPA seed funding. Green chemistry constitutes the "benign by design" principle and is applicable to products (what you make) and processes (how you make it). To be true green chemistry, a new technology must reduce or eliminate hazards.

Potential Use in Training

- Discussion of the power of public information to effect change
- Discussion of why it is easier to quantify hazards and then reduce risk through material selection.

Session III: How Do You Know Where to Start - Methods to Identify Hazardous Chemicals in the Workplace

In order to identify hazardous chemicals in the workplace, methods of exposure monitoring are needed. However, use of traditional, stationary instruments to measure occupational exposures can be ineffective.

Kim Anderson, Ph.D., is director of the Food Safety and Stewardship Program and is affiliated with the NIEHS Superfund Research Program (SRP) at Oregon State University through which this research was partially funded. Her research team has developed a silicone wristband passive sampling device (PSD) that performs exposure monitoring and holistic sampling in various occupational settings. Anderson currently has a patent pending for the wristbands. The wrist bands are powerful and effective monitoring tools that are ideal for monitoring exposures in various occupational settings (see inset).

The PSD membrane mimics a cell membrane, where some substances come in while others are blocked out. The PSD technology utilizes chemical reaction kinetics, where concentrations in the membrane at any given time are determined by competing rates of uptake and release. Isotopically-labeled surrogates are infused into the PSD to calibrate chemical concentrations. These internal surrogates are used as a reference for calibrating the concentration of sequestered environmental chemicals (i.e., *in situ* calibration).

The wristbands are essentially biological response indicator devices for gauging information about environmental stressors. The wristbands are changing the field of exposure monitoring and assessment, and have received lots of attention in the *media*. Anderson's group has screened about 1,400 chemicals using the wristband technology. The technology offers opportunities to obtain information about exposures from air, water, and sediment, as well as specific chemicals such as PCBs, PAHs, and flame retardants.

Anderson is collaborating with several groups to explore use of the wristband technology in different occupational and epidemiology studies. For example, she has performed a pilot occupational study to measure PAH exposure among roofers.

Overall, the wristband passive sampling platform offers the ability to provide workers and other individuals with information about personal hazardous chemical exposures. Anderson said that she intends to make the wristbands available for other investigators to use.

Wristband PSD Advantages

- Lightweight, robust and easy to use during work or daily activities
- Applicable for many environments and chemicals, and suitable for mixtures
- Can be placed on companion or farm animals
- Can be used to monitor exposures following environmental disasters (e.g., first responders, clean-up crews, and citizens in disproportionately affected in neighborhoods)
- Chemicals extracted from the wristbands can be used for testing in *in vivo* and/or *in vitro* assays
- Can be stored and archived for later chemical analysis

Session IV: Overview of Tools to Help You Navigate the Process

Charlotte Brody, vice president of health initiatives at *BlueGreen Alliance*, discussed her professional experiences in improving occupational health and environmental health. Brody is the former national field director for *Safer Chemicals, Healthy Families*, a nationwide effort to pass improved federal policies on toxic chemicals.

Brody said that, to improve worker safety and health, it is important to identify the issues including any associated costs. *Putting Breast Cancer Out of Work*, a BlueGreen Alliance project, is an example of an effort to prevent breast cancer by promoting use of safer chemical alternatives. The program operates through a workplace model utilizing approximately 45 worker trainers to conduct classes.

"There is also a need to connect the sustainability efforts of employers with safety and labor management teams," Brody stated. BlueGreen Alliance has been conducting hazard training for workers on chemical risks at AT&T and Verizon. In the past, AT&T was fined for violations of hazardous waste laws, and now workers are negotiating to move away from the use of more problematic hazards. Other companies are also beginning to realize the benefit of shortening the chemical supply chain and building relationships with people who manufacture the products.

Several organizations have developed online tools that allow users to find specific information on the chemicals they work with and to find out if safer chemicals may be used. Brody guided workshop participants through an exercise of evaluating some of these online tools by several criteria: usability, application for training, types of chemicals inventoried, and applicability for use in training (see Appendix 2). Some of the tools were very large (required a lot of scrolling, or time to load), which would make them too cumbersome for a training environment. Some of them required another application to use (e.g., a barcode), and the listed chemicals varied greatly among the tools. There have been issues where manufacturers apply a new chemical name to an old chemical CAS number. Therefore, it is important to use the chemical name and CAS number when searching among these tools. General comments and feedback for some of these online tools are shown in Table 1.

Brody's talk set-up the resources discussed during later breakout sessions, in which similar comments on these and other online tools were provided (refer to Breakout Sessions, pages 12-14).

Potential Use in Training

- Discussion of resources to train workers and their potential value.

Session V: Protecting Yourself from Unnecessary Exposures While Everything Burning Around You Is Toxic – Addressing a Firefighter's Perspective

Patrick (Pat) Morrison from the *International Association of Firefighters* (IAFF) addressed issues related to on-the-job exposures for firefighters. As assistant to the general president for occupational health, safety, and medicine at the IAFF, Morrison oversees the planning, training, development, and implementation of all IAFF education, training, and human relations efforts throughout the U.S. and

Table 1

Sample of User Comments on Online Tools

Online Tool	Organization that Developed the Tool	Positive Features	Limitations	Recommended for Use in Training
RISCTOX	Spanish Trade Union	• User-friendly and simple • Searchable by toxin or CAS number • Toxins categorized by type • Lists known health effects and related regulations • Available in English and Spanish		Yes
SkinDeep	Environmental Working Group	• Consumer product focused • Includes barcode scanner	• Rated as 'ok', but not particularly exciting	Yes
SubSport	Consortium of European Union organizations and universities	• Includes links to red lists of toxic chemicals created by other organizations • Provides information about safer alternatives, and advantages of using alternatives	• Complicated (includes several databases) • Issue of defining credibility	No

Canada. He also oversees the IAFF Burn Foundation and Hazardous Materials programs.

According to Morrison, today's fires are hotter, faster, and usually already in flashover by the time firefighters arrive on the scene. Flashover is the nearly explosive combustion of superheated material and occurs more frequently now because today's homes have more items that are flammable. In the past, cumulative effects of on-the-job exposures for firefighters were not completely understood. Now the IAFF has an ongoing prevention campaign on this issue.

Morrison cited statistics showing that occupationally associated cancer causes more than 50 percent of line-of-duty deaths in firefighters. Comparison of cancer prevalence in firefighters versus the general public is always difficult. Compared to the general population, firefighters are typically healthier with lower mortality rates. However, the causes of death among firefighters differ from the general public. For example, prostate cancer is typically seen in older men in the general population, but it is found at higher rates among young firefighters.

Recent epidemiology studies, including a National Institute of Occupational Safety and Health (NIOSH) study of 30,000 career firefighters, have brought attention to these job-related cancers. These studies looked at death certificates dating back to 1950, and found evidence of increased rates of cancer among the firefighters. Until recently, mesothelioma was not listed because its latency was longer than the career of a firefighter. Some states offer additional health

benefits and workers compensation for firefighters with these cancers. Absorption of soot on the skin is thought to contribute to some of these elevated rates of disease because extreme sweat, heat, and vasodilation combined with compression of gear pushes soot into the skin.

Potential Use in Training

- Discussion of occupational cancers in other specific workplaces or occupations.

Session VI: Toxic Hot Seat Viewing

Morrison invited workshop attendees to view the documentary entitled, "*Toxic Hot Seat*," which describes the historical links between the tobacco industry and flame retardants, and stakeholder efforts to eliminate the use of these toxic chemicals.

The film was created by Jamie Redford and features the *Chicago Tribune's* investigative report on chemical companies and flame retardants. Among other things, "the film shows how chemical companies obscured the risks to public health and misrepresented chemical safety data by paying 'experts' to alarm legislators and the public about the deadly risk of removing chemical flame retardants from our homes." (*www.toxichotseatmovie.com*) Some companies appear reluctant to use the flame retardants, but they are cheap and pass the open flame test. These companies are now interested in applying barrier methods with different fabric weaves.

Morrison is hopeful that information from this documentary can be used by other institutes and organizations. For example, some organizations are continuing to *petition* federal agencies to ban products containing toxic flame retardants.

Breakout Sessions

Participants divided into breakout sessions to further explore the issues raised during the plenary talks (see Appendix 1).

Globally Harmonized System (GHS) Column Model: Breakout Session I

Darius Sivin guided a discussion that included an overview of GHS column modeling. Participants also discussed an interpretation guide for the Safety Data Sheet (SDS) that is used for ranking across risk factors.

Participants went over the SDS and learned how to look up codes using the GHS Column Model tool. They completed an exercise comparing one high-impact chemical, trichloroethylene, to two other chemicals with lower impacts on workers. For example, the alternative chemicals had higher flammability, but lower hazards for reproductive cancer. Faced with these kinds of choices, participants realized the need to consider alternatives that have the lowest overall impact on workers. They also saw the need for the facility to layout the hazards and select alternatives based on the facility's capability and needs. Chemical or proprietary mixtures may be a concern, as well as storage.

Participants concluded that this type of exercise can be very detailed, and has its own language. If a worker has never seen an SDS, it would be difficult and take a lot of time to complete the exercise in training. The Column Model should be thought of as a way to begin thinking about various factors that impact and are affected by chemical substitutions. This information would contribute to the structuring of activities in trainings that may include a mix

of visuals, cases, and targeted guidance on what resources to use for more information. This exercise may be most useful for trainees who already have training on basic hazard communication, industrial hygiene principles, and reading an SDS. This type of exercise could be useful in a union setting with hazardous materials committees. They could use it to determine what works best within the dynamics of a particular workplace.

In conclusion, participants agreed that selecting substitute chemicals is more of an art than a science. The GHS column model is a chemical safety model that allows you to lay out the hazards. The process in identifying alternative substitutes must include an assessment of new risks that might arise. In addition, there are other associated risks worth considering (other than chemical) such as quality, financial, and process risks.

Transitioning to Safer Chemicals Activities Breakout Sessions II & III

Many organizations and worker advocates have been working on developing "*Transitioning to Safer Chemicals: A Toolkit for Employers and Workers*." This toolkit introduces the alternatives assessments method for industrial facilities to use and determine if unnecessary toxic chemicals are being used, and what changes can be made to transition to safer chemicals. The toolkit has been provided as a resource to help workers understand how they can advocate for these changes.

A day long training featuring the toolkit has been developed, which includes several activities. The activities take workers through a step-by-step process to help them think about and understand the process of alternatives assessment. WTP workshop participants were provided an opportunity to pilot these activities during two breakout sessions.

The first activity challenged participants to use different online tools to identify chemical alternatives and hazards, and discuss methods of guiding workers through alternatives assessments. Participants were given a hypothetical scenario that involved recommending paint stripping alternatives for a company. As a collective group, participants looked at different online resources to determine how much information could be found about methylene chloride (and chemical alternatives). General comments and feedback for some of these online tools are shown in Table 1 (page 11). Credibility was an issue of concern for some, as it was difficult to determine the organization responsible for development of the information. While the tools are very good resources to explore, most are complex, so implementation and usability during training would be difficult.

For the second activity, participants were asked to give their impressions on use of the SDS and *ChemHAT* to identify various pieces of chemical hazard information. Overall, they noted that the SDS was not very user-friendly, as its length and complexity made it extremely time consuming. These factors may present a major barrier to non-native English speakers. They also found that the SDS contained missing or conflicting pieces of information, with no acknowledgement of the missing elements. Participants concluded that successful use of the SDS would require adequate time and training for workers.

More positive experiences were described for use of the online ChemHAT tool. Participants found the tool to be searchable by CAS number and that it provided specific information about long-term health effects. However, there were also some limitations regarding

its use. Though multiple tabs within the tool offered more resources (e.g., multiple languages and safer alternatives), these tabs may also add to complexity, complication, and time required to get information. ChemHAT offered different pictograms for hazards, though they were not consistent with the GHS model. In addition, the tool did not offer other precautionary information such as what PPE to wear, what to do if exposed, or how clean-up should be performed. They also noted that usability of the mobile version of the tool was different from the full online version.

They concluded that this type of exercise would be ideal for training to help people practice identifying the hazards of chemicals. It may be worthwhile to use multiple tools and databases for training, rather than limiting exercises to one (i.e., a combination of SDS and ChemHAT). Building the capacity to even search for the alternatives was noted as an important skill for workers to develop, as many are unfamiliar with the idea of safer substitution. There needs to be a commitment to training that includes using a top-to-bottom approach. We need to demonstrate to employers and workers that these ideas are feasible, and build up from there.

Participants noted that the ChemHAT Playing Cards, which display ChemHAT icons and the pictograms for the OSHA Globally Harmonized System of Classifying and Labeling Chemicals, are a great resource and would be ideal for icebreaker activities.

Conclusions

The WTP and its awardees are uniquely positioned to facilitate training and offer guidance for workers on chemical hazard identification and alternatives assessment. WTP grantees should explore ways to raise worker and employer awareness about available resources on this topic.

Workshop participants learned about the importance of considering safer chemical initiatives and the key drivers of these initiatives. Though federal regulation is outdated, certain organizations and states are addressing these issues through the development of safer consumer products and by requiring greater disclosure of chemical information. Scientists are exploring more effective methods of occupational exposure and hazard assessment, which will likely better inform the WTP's response to environmental disasters and resilience of worker education and training.

Participants also learned about the abundance of resources that exist regarding assessment of chemical hazards and alternatives. Even with the vast abundance of resources, time limitations and the complexity of the problem remain an issue. Therefore, creative methods and activities for delivering worker training on identifying chemical hazards and alternatives should be explored. The WTP is uniquely positioned to facilitate this type of training environment and raise awareness about these issues.

In summary, a number of primary themes emerged from the conference:

- While federal law is outdated and the regulatory system is broken, global chemical production is on the rise. This means an increase in exposure, hazards, and environmentally induced diseases (e.g., cancer).
- Positive action is being taken. Some companies and organizations are utilizing green chemistry initiatives to change chemical selection, facilitate efforts towards choosing safer alternatives, and eliminate hazardous chemical exposures in the workplace.
- State policy is a key driver for implementing safer chemicals. States have the capacity to form unique partnerships that can collect data on chemical use, disclose information to consumers, guide alternatives assessments, and inform stakeholder processes towards product bans and safer chemical initiatives.
- More effective methods are needed to assess hazardous chemical exposures in the workplace. Passive sampling technologies offer unique opportunities for holistic sampling that can be used across various occupational settings.
- A variety of existing tools and resources are available online that can help employers and employees navigate through the process of identifying chemical hazards and safer alternatives.

National Institute of Environmental Health Sciences
Worker Training Program

Spring 2015 Workshop

Protecting Workers from Hazardous Chemical Exposures through Training

February 26-27, 2015
911 Federal Building, 911 NE 11th Avenue > Portland, Oregon

Thursday, February 26, 2015

7:30–8:30 a.m. **Registration** ..... *Auditorium Lobby*

8:30–9:00 a.m. **Welcome** ..... *Auditorium*
Joseph "Chip" Hughes, NIEHS

What's driving all of these approaches to safer chemicals and how they are relevant to the WTP?

9:00–9:30 a.m. **Current Laws are Not Protecting Us from Chemicals**
Elizabeth Grossman, Journalist

9:30–10:30 a.m. **Things Are Beginning to Change**
MODERATOR: *Craig Slatin, University of Massachusetts Lowell - The New England Consortium-CSEA*
James Connelly, International Living Future Institute
Paul Davis, Columbia Forest Products

Questions and Answers

10:30–10:45 a.m. **Break**

10:45–11:45 a.m. **Drivers of the Change to Safer Chemicals**
MODERATOR: *Sharon D. Beard, NIEHS*
Sarah Doll, Safer States
Alex Stone, Washington State Department of Ecology

11:45 a.m.–12:45 p.m. **Lunch** ..... *Cafeteria*

1:00–1:30 p.m. **How Do You Know Where to Start? Methods to Identify Worst Chemicals in a Workplace** ..... *Auditorium*

MODERATOR: *Joseph "Chip" Hughes, NIEHS*

Kim Anderson, Oregon State University Environmental and Molecular Toxicology Department—Passive Sampling to Identify Worst Exposures

1:30–3:15 p.m. **Overview of Tools to Help you Navigate the Process**

Charlotte Brody, BlueGreen Alliance

3:15–3:30 p.m. **Break**

3:30–3:45 p.m. **Protecting Yourself from Unnecessary Exposures, while Everything Burning around You is Toxic**

Patrick Morrison, International Association of Fire Fighters

3:45–5:15 p.m. **Viewing of Toxic Hot Seat**

Friday, February 27, 2015

9:00–9:20 a.m. **Overview of the Breakout Sessions** ..... *Auditorium*

9:30–11:00 a.m. **Breakout Sessions** ..... *Auditorium, Conference Rooms A, B and C*

- **GHS Column Model**
  Darius Sivin, UAW
- **Transitioning to Safer Chemicals Activity—Session 2**
  Craig Slatin and Dave Coffey, University of Massachusetts Lowell - The New England Consortium-CSEA
- **Transitioning to Safer Chemicals Activity—Session 3**
  Luis Vazquez, ICWUC Center for Worker Health and Safety Education

11:00–11:15 a.m. **Break**

11:15–11:45 a.m. **Report Back** ..... *Auditorium*

11:45 a.m.–12:00 p.m. **Wrap-up**

12:00 p.m. **Adjourn**

APPENDIX 2 - Protecting Workers from Hazardous Chemical Exposures through Training: Tools To Help You Navigate the Process

The following resources were explored by participants during the workshop. Participants were asked to pick a website and consider the questions listed below regarding the tool's usability in training and educating workers about the transition to safer chemicals.

http://www.epa.gov/dfe/saferingredients.htm

http://toxnet.nlm.nih.gov

http://www.ecy.wa.gov/programs/hwtr/chemalternatives/QCAT.html

http://sinlist.chemsec.org

http://www.subsport.eu

http://www.hazwastehelp.org/educators/chemlist.aspx

http://www.istas.net/risctox/en/

www.chemhat.org

http://www.chemicalfootprint.org

www.justorganizations.com

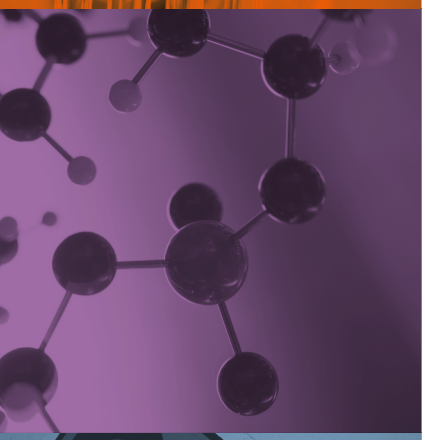
www.goodguide.com

www.ewg.skindeep.org

…and answer the following questions:

- Which tool did you review?
- What does the tool do?
- Who made the tool?
- What was your experience in using the tool?
- Any surprises?
- Would you use this tool in a training? If yes, how?


2
0



National Institute of Environmental Health Sciences

Worker Training Program

This publication was made possible by contract number 273201000083U from the National Institute of Environmental Health Sciences (NIEHS), NIH.